

Name

Key

Date

## Word Problems

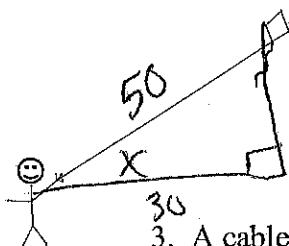
1. What is the angle of elevation of the sun when a tree 6.25 m tall casts a shadow 10.1 m long?



$$\tan X = \frac{6.25}{10.1}$$

$$X = 31.7^\circ$$

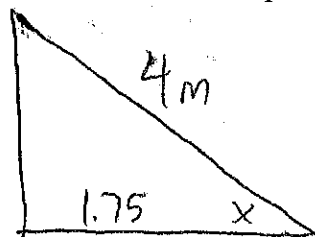
2. A boy flying a kite is standing 30 ft from a point directly under the kite. If the string to the kite is 50 ft long, find the angle of elevation of the kite.



$$\cos X = \frac{30}{50}$$

$$X \approx 53.1^\circ$$

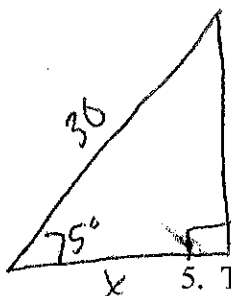
3. A cable 4 m long is attached to a pole. The cable is staked to the ground 1.75 m from the base of the pole. Find the angle that the cable makes with the ground.



$$\cos X = \frac{1.75}{4}$$

$$X \approx 64.1^\circ$$

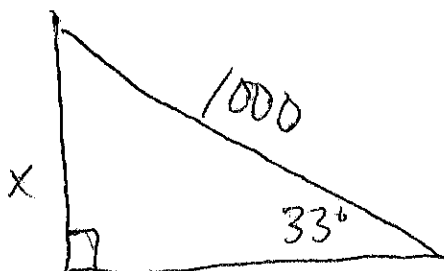
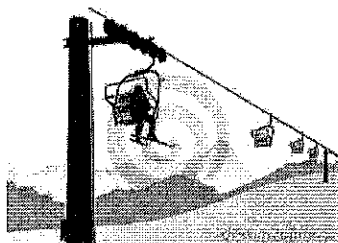
4. How far from the base of a building is the bottom of a 30ft ladder that makes an angle of  $75^\circ$  with the ground?



$$\cos 75 = \frac{X}{30}$$

$$X \approx 7.8 \text{ ft}$$

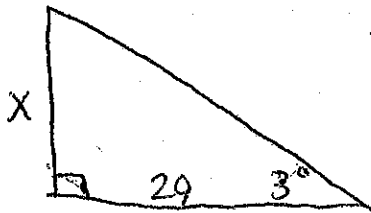
5. The angle of elevation of the summit of a mountain from the bottom of a ski lift is  $33^\circ$ . A skier rides 1000ft on this ski lift to get to the summit. Find the vertical distance between the bottom of the ski lift and the summit.



$$\sin 33 = \frac{X}{1000}$$

$$X \approx 544.6 \text{ ft}$$

6. The approach pattern to an airport requires pilots to set  $3^\circ$  angle of descent toward the runway. The airport recommends that the pilots begin this descent 29 miles from the runway. If this is true, what should be the altitude of the plane when the pilot begins the descent? (Give answer in ft.  $1 \text{ mi} = 5280 \text{ ft}$ )



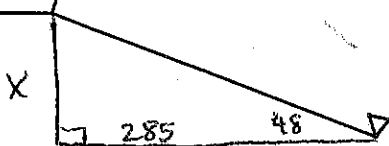
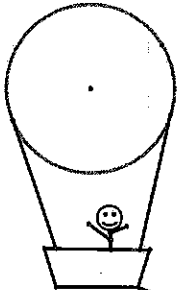
$$\tan 3 = \frac{X}{29}$$

$$1.5 \text{ mi} \approx X$$

If use stored answer 8024.7 ft

If use 1.5 7920 ft

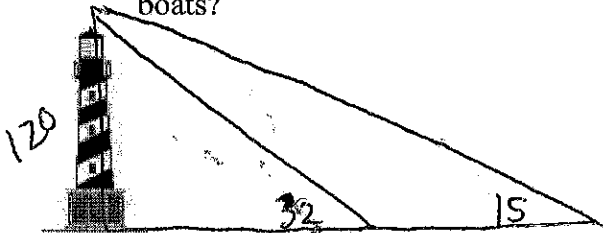
7. The distance from the point directly under a hot air balloon to the point where the balloon is staked to the ground with a rope is 285 ft. The angle of elevation up the rope to the balloon is  $48^\circ$ . Find the height of the balloon.



$$\tan 48 = \frac{X}{285}$$

$$X \approx 316.5 \text{ ft}$$

8. Two boats are seen approaching a 120ft lighthouse. The angle of depression for one boat is  $32^\circ$ . The angle of depression for the other boat is  $15^\circ$ . How far apart are the boats?



$$\tan 15 = \frac{120}{y}$$

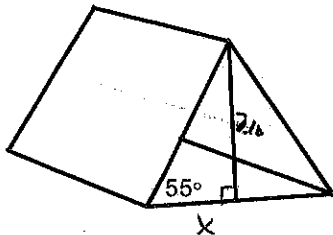
$$y \approx 447.8$$

$$\tan 32 = \frac{120}{x}$$

$$x \approx 192.0$$

$$255.8 \text{ ft}$$

9. A camping tent is supported by a pole,  $\perp$  to the ground, with a height of 210 cm. If the sides of the tent make an angle of  $55^\circ$  with the level ground, how wide is the tent at the bottom?



$$\tan 55 = \frac{210}{x}$$

$$x \approx 147.0 \times 2$$

$$294.0 \text{ cm}$$

10. From the top of a 135 ft observation tower, a park ranger sights two forest fires on opposite sides of the tower. If their angles of depression are  $42.5^\circ$  and  $32.6^\circ$ , how far apart are the fires?

$$\tan 42.5 = \frac{135}{x}$$

$$x \approx 147.3$$

$$\tan 32.6 = \frac{135}{y}$$

$$y \approx 211.1$$

$$211.1$$

$$+147.3$$

$$358.4 \text{ ft}$$

